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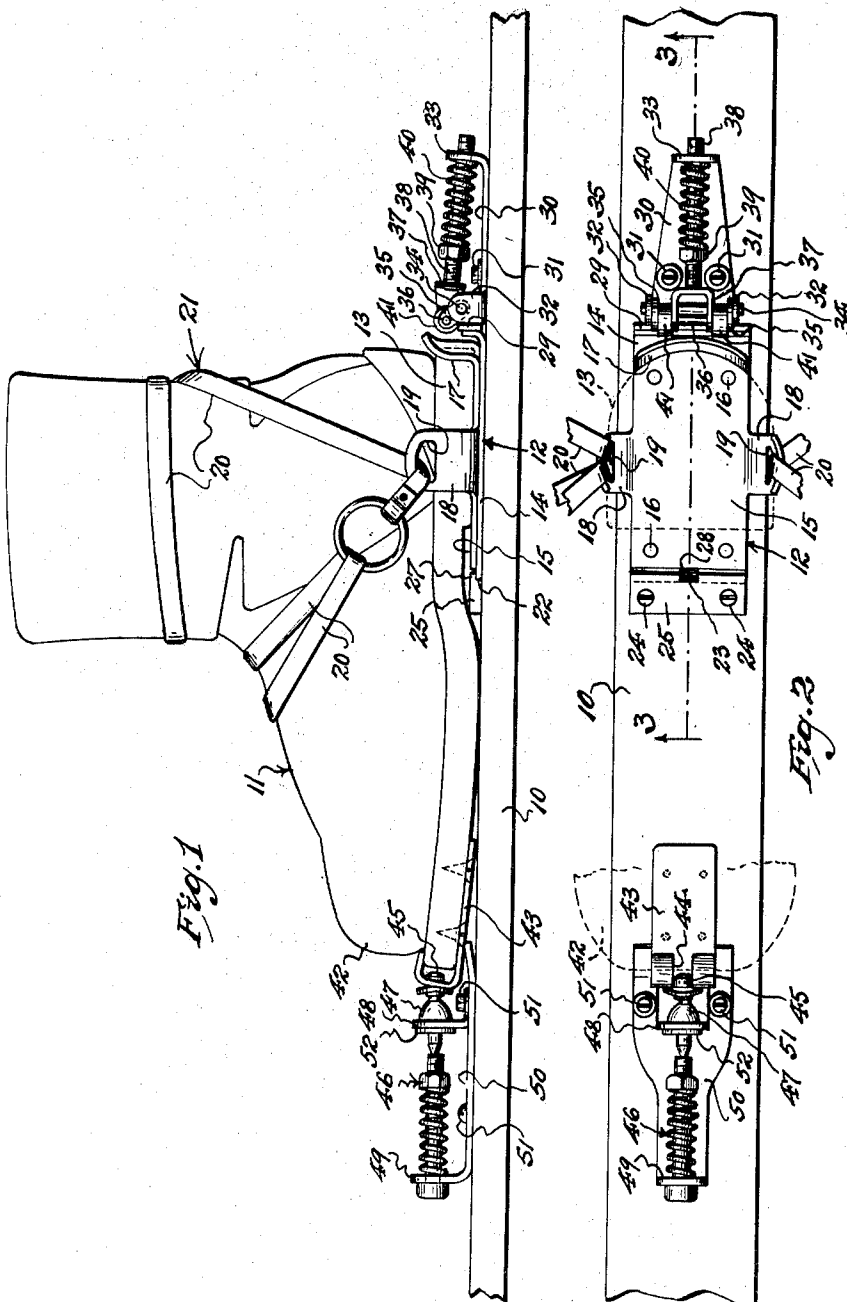
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3,145,028

SAFETY SKI BINDING OF THE STRAP OR LONG THONG HARNESS TYPE

Filed May 24, 1962

2 Sheets-Sheet 1



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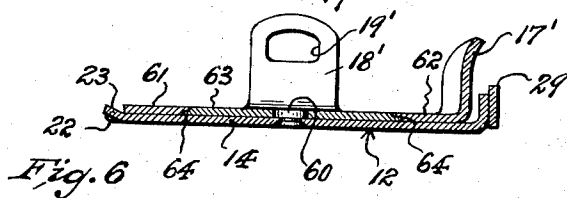
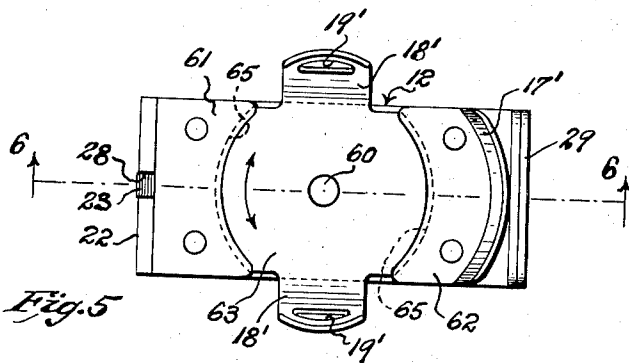
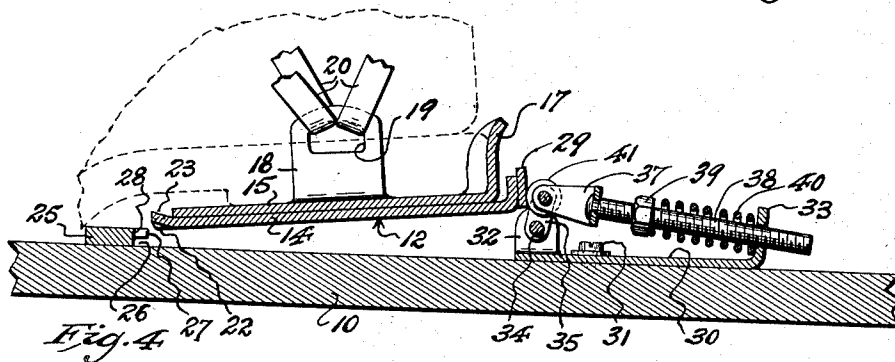
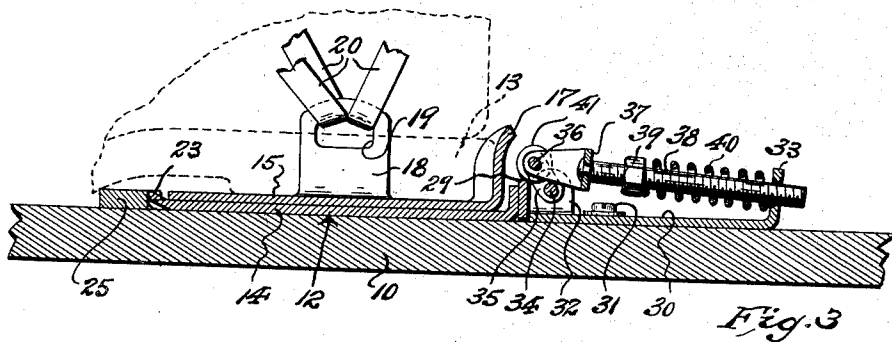
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SAFETY SKI BINDING OF THE STRAP OR LONG THONG HARNESS TYPE

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2 Sheets-Sheet 2



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**SAFETY SKI BINDING OF THE STRAP OR
LONG THONG HARNESS TYPE**
Mitchell H. Cubberley, 121 Bell St., Belleville, N.J.
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2 Claims. (Cl. 280—11.35)

This invention relates to an improved construction of safety ski binding or attachment of the strap or long thong harness type which is operative to couple a ski to the user's boot, but which is self-releasing for freeing the boot from the ski in the event of a fall or other mishap.

Many skiers prefer to use ski bindings which utilize a system of strap or long thong harness directly attached to the ski, and wrapped around the ski boot to hold down the heel of the boot relative to the ski. Such direct attachment to the ski of the strap or long thong harness, which is wrapped around the ski boot, does not provide for quick and automatic release of the boot from the ski in the event of a fall or other mishap, and consequently cannot be considered a safety attachment, although often used by expert skiers who are willing to forego the safety factor. However, with respect to novice and less skilled skiers, the advantages of strap or long thong boot engaging harness would be desirable if a safety factor of quick and automatic boot release were provided.

It is therefore an object of this invention to provide a ski binding having the desired boot engaging strap or long thong harness, but which includes means to quickly and automatically release the boot from its attached relation to the ski under abnormal circumstances.

This invention has for a further object to provide a novel boot heel plate structure adapted to be tied to the skier's boot by a strap or long thong harness which is wrapped around said boot, novel means being provided to releasably attach said heel plate structure normally to the ski; and, if desired, additional means may also be included to releasably attach the toe of the boot to the ski.

Other objects of this invention, not at this time more particularly enumerated, will be understood from the following detailed description of an illustrative embodiment of the invention as shown in the accompanying drawings, in which:

FIG. 1 is a fragmentary side elevational view of a ski equipped with the novel ski binding of this invention, the boot heel and, if provided, the boot toe retaining devices of which are respectively shown in their operative holding relation to the heel and toe of the ski boot, whereby to attach the ski to the boot; and FIG. 2 is a plan view of the ski and ski binding of FIG. 1, the heel and toe portions of the engaged ski boot being shown by broken lines.

FIG. 3 is a longitudinal sectional view through the ski and boot heel plate structure taken on line 3—3 in FIG. 2, the boot heel structure being releasably coupled to the ski, and this view being drawn on an enlarged scale; and FIG. 4 is a similar view showing the boot heel plate structure released from its normal coupled relation to the ski.

FIG. 5 is a plan view of the heel plate structure as modified to include a turn-table element to which the boot engaging strap or long thong harness is attached; and FIG. 6 is a longitudinal sectional view of the same, taken on line 6—6 in FIG. 5.

Similar characters of reference are employed in the hereinabove described views, to indicate corresponding parts.

Referring to the drawings, the reference character 10 indicates the body of a ski, and the reference character 11 indicates a skier's boot to which the ski is to be attached or coupled for use.

The ski body 10, according to this invention, is provided with a heel plate structure 12, which is detachably affixed thereto, and which, is adapted to receive the heel

portion 13 of the ski boot 11 which is to be coupled to said ski. This heel plate structure comprises a bottom plate 14 upon which is superimposed a top plate 15. Preferably these top and bottom plates are secured together, as by rivets 16, so as to provide a unitary formation. Although such two-piece construction of the heel plate structure is deemed preferable, from a production standpoint, it will be understood that said structure may be produced in a one-piece or integral form, if so desired.

At its rearward end, the top plate 15 of the heel plate structure 12 is provided with an upstanding, preferably transversely arcuate back wall 17 against which the heel portion 13 of the applied boot 11 abuts, so that said boot is stopped against rearward displacement relative to the heel plate structure. Projecting from the opposite sides of the top plate 15, at suitable locations intermediate the ends thereof, are outwardly offset, upwardly projecting strap or long thong harness attaching tongues 18; said tongues having, adjacent their free ends, openings 19 through which straps or long thongs 20 of a boot engaging and enveloping harness 21 extend, whereby to bind the heel plate structure 12 to the ski boot 11, when the latter is operatively applied and coupled to the ski 10 by the former. These tongues 18 straddle the boot, and therefore prevent sidewise displacement of the boot relative to the ski.

The bottom plate 14 of the heel plate structure 12 exceeds in length that of the top plate 15, thus providing said bottom plate with respective forward and rearward end portions to freely extend beyond corresponding ends of the top plate. The free forward end of the bottom plate 14 provides a transverse lip portion 22, and formed in connection therewith, intermediate its sides, is a key lug 23 which is shaped to incline upwardly above the top surface plane of said bottom plate.

Permanently affixed to the ski body 10, as e.g. by screws 24 or other suitable fastening means, is a transverse anchoring block 25, the rearward face of which is undercut to provide a recess 26 beneath a shoulder 27. When the heel plate structure 12 is operatively mounted on the ski body 10, the lip portion 22 can be withdrawably inserted into the recess 26 and beneath the shoulder 27 of the anchoring block 25; thus releasably locking down the forward end of the heel plate structure onto the ski body. In order to prevent sidewise displacement of the thus anchored down forward end of the heel plate structure, said shoulder 27 of the anchoring block 25 is provided with an indenting notch 28 into which the key lug 23 can be entered, thus inhibiting sidewise movement of the forward end of said heel plate structure.

The free rearward end of the bottom plate 14 is suitably shaped to provide a transverse upstanding keeper member 29, which is rearwardly offset behind the back wall 17 of the top plate 15.

Permanently mounted on the ski body 10 is a latching means operative to releasably lock down the rear end of the heel plate structure, and thereby the ski boot 11 which is bound thereto by the strap or long thong harness 21, in operative assembled and attached relation to said ski body. This latching means comprises a base plate 30 which is affixed to the ski body by screws 31 or other suitable fastening means. At its forward end, said base plate 30 is provided with transversely aligned, upstanding perforate bearing ears 32, and at its rearward end with a transverse upstanding perforate guide ear 33. Journaled in and between the bearing ears 32 is a shaft 34 which pivotally supports a pair of spaced apart, upwardly and radially directed, lever links 35. Journaled in and between upper free ends of the lever links 35 is a second shaft 36. Pivotally connected with the medial portion of said second shaft 36 is a bifurcate yoke member 37, to which is affixed a rearwardly extending, screw-threaded stem 38, the

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free end of which extends slidably through the perforate guide ear 33. Adjustably threaded onto said stem 38 is a stop nut 39, and mounted around said stem, intermediate the guide ear 33 and the stop nut 39 is a compression spring 40. Carried by said second shaft 36, respectively intermediate the lever links 35 and the sides of the yoke member 37, are check or latching elements 41, which are preferably of roller form. It will be obvious from an inspection of the drawings that the regulated tension of the compression spring 40, which thrusts forwardly from the guide ear 33 against the stop nut 39, will cause the stem 38 and yoke member 37 to move forward, thus forwardly swinging the lever links 35, and thereby carrying the check or latching elements 41 over and so as to exert yieldable downward thrust and pressure upon the keeper member 29 of the heel plate structure 12, when the latter is flatly disposed upon the ski body 10, thus releasably locking down said heel plate structure, and the boot 11 tied thereto by the strap or long thong harness 21, in operative attached relation to the ski body 10 (see FIG. 3).

For cooperation with the above described boot heel releasable attachment means, the ski body 10 must also be provided with means to engage and hold thereto the toe 42 of the boot 11, subject to release and withdrawal of said boot toe 42 therefrom when the heel portion 13 of the boot is released. Such boot toe engaging means may be of any suitable form and construction which is adapted to so function.

A desirable releasable boot toe attachment means may be of a form and construction such as is disclosed in my prior United States Letters Patent No. 2,616,714 dated November 4, 1952. Such boot toe attachment means generally comprises a toe plate 43 which is affixed to the boot sole at the boot toe 42, said toe plate having a forwardly projecting portion which is indented by a seating notch 44, and a holding means which is cooperative with said toe plate. Said holding means comprises a latching lever 45 and a spring actuated thrust means 46, with a pivotal joint 47 connecting said latching lever and thrust means in end to end relation. Said parts are supported by upstanding end plates 48 and 49 of a base plate 50, the latter being secured to the ski body 10 by screws 51 or other suitable fastening means. The rear free end of the latching lever 45 engages in the seating notch 44 of the toe plate 43. The latching lever 45 is provided with a radially extending fulcruming flange 52 adapted to normally bear flatly against a face of the end plate 48 of the fixed base plate 50 under the pressure of the spring actuated thrust means 46. Peripheral portions of the fulcruming flange 52 provide fulcrum points about which the latching lever 45 can pivot relative to said end plate 48, when said latching lever is subjected to transversely applied or uplifting force sufficient to overpower the counterforce of the thrust means 46, thereby to disengage the latching lever 45 from the seating notch 44 of the boot toe plate 43, with boot toe releasing effect, all as more particularly set forth in my aforesaid prior Patent No. 2,616,714.

It will be understood that the latching means, which is operative upon the rear end of the heel plate structure 12, is so tensioned by its spring 40 as to well resist any displacement of the heel plate structure from its boot attaching relation to the ski body 10 due to normal upward pulling stresses or strains to which the ski is subjected in use. In the event of a fall of other occurrence which induces an abnormal upward pulling stress or strain, tending to separate the heel plate structure and boot from attached relation to the ski body, said latching means will yield so as to disengage the rear end of said heel plate structure for separation and detachment from the ski body (see FIG. 4).

When the heel plate structure 12 and boot 11 are released from the holding effect of the latching means, the heel plate structure tends to move rearwardly, thereby withdrawing its forward lip portion 22 from the recess 26

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of the anchoring block 25, thereby fully detaching the heel plate structure 12 and boot 11 from the ski body 10 (again see FIG. 4).

As the heel plate structure 12 and the boot 11 which is tied thereto by the strap or long thong harness 21 is separated from the ski body as above described, it will be obvious that the toe 42 of the boot 11 will free itself from the forward boot toe holding means, and consequently the skier's boot will be entirely detached and separated from the ski.

To facilitate return of a released heel plate structure 12 to normal assembled relation to the ski, any lever means, such as the spike end of a ski pole, can be inserted against the shaft 34 and yoke member 37 of the latching means, and utilized to swing back said latching means to permit downward reseating movement of the rear end of the heel plate structure.

From the above it will now be understood that the coupling of the ski to the user's ski boot according to this invention permits use of a strap or long thong harness in connection with the boot and leg of the skier, which use is so frequently desired by skiers, while nevertheless providing the additional advantage of quick and automatic separation and detachment of the skier's boot from the ski, as a safety factor in the event of a fall or other mishap.

With respect to the use of strap or long thong harness for binding a ski to the skier's boot, it is desirable to permit more or less free twisting or turning of the boot relative to the attached ski, when lateral movement of the toe of the boot is required to effect boot toe release. To permit this the harness can be connected with a turn-table element associated with the ski. The advantage of such arrangement may, if desired, be provided for in connection with the heel plate structure 12 of this invention, as shown in FIGS. 5 and 6 of the accompanying drawings. In such case, the bottom plate 14 of the heel plate structure 12 is of the same form and construction as heretofore described, except that it is provided with a fixed pivot stud 60 upstanding therefrom intermediate its ends. The top plate of the heel plate structure is modified by dividing the same to provide a forward section 61 and a rearward section 62, both suitably affixed to the bottom plate 14, so as to be unitary therewith. The rearward section 62 includes the arcuate boot heel abutting back wall 17'. Rotatably mounted on the pivot stud 60, between said top plate sections 61 and 62, is a turn-table element 63. The end portions of the turntable element are preferably provided with lips 64 of reduced thickness, to engage in undercut recesses 65 with which the arcuate inner ends of the top plate sections 61 and 62 are provided, thus holding the turn-table element against displacement from the bottom plate 14 of the heel plate structure, while nevertheless being free to rotate relative thereto. Unitary with and extending from opposite sides of the turntable element 63 are outwardly offset, upwardly projecting harness attachment tongues 18', the same having openings 19' to receive and anchor to the turntable harness straps or long thongs 20, which are adapted to be wrapped around and secured to the skier's boot. It will be understood that the harness, being thus anchored to the turntable element 63, will, when exerting twisting pull upon the latter, cause the same to yield rotatably to sidewise movements of the boot toe when release thereof is required.

Having now described my invention, I claim:

1. In a ski binding, the combination with a ski body having means to detachably connect the toe of a ski boot thereto, a heel plate structure applicable to a boot heel and adapted to be mounted on the ski body in detachable relation to the latter, said heel plate structure comprising a bottom part and a top part unitary therewith, the rear end of said top part having an upstanding arcuate back wall to embrace a received boot heel, said bottom part exceeding in length the length of the top part, whereby to provide a transverse lip portion to project freely beyond

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the forward end of the top part and a rearward extension to project freely beyond the heel embracing back wall of the top part, said rearward extension terminating in an upstanding keeper means, said forward transverse lip portion of the bottom part having an upwardly projecting key lug, a transverse anchoring block adapted to be secured to the ski body, the rearward face of the anchoring block being undercut to provide a recess beneath an overhanging shoulder, said recess being adapted to normally receive the forward lip portion of the heel plate structure, whereby to releasably attach the forward end of the heel plate structure to the ski body, said shoulder having an indenting notch to receive said key lug, whereby to prevent lateral displacement of the attached forward end of the heel plate structure, the ski body having yieldable holding means to releasably engage said keeper means, whereby to normally attach the rear end of the heel plate structure to the ski body, and said heel plate structure being provided at opposite sides thereof with upwardly extending perforate tongues engageable by a strap or long thong harness adapted to be applied to the boot for attachment of the heel plate structure thereto.

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2. In a ski binding according to claim 1, wherein a rotatable turntable element is rotatably mounted upon the heel plate structure, and wherein the strap or long thong harness engageable perforate tongues extend from the sides of said turntable.

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